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STEP

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TITLE: Some characteristics of the physical processes in a storage tube with a one-sided target

PERIODICAL: Tekhnika kino i televideniya, no. 12, 1962, 41 - 47

TEXT: A graphecon tube fitted with a one-sided target electrode is considered. This is illustrated in Fig. 1. The elements of the target are first scanned by the reading beam having an energy of 1 keV and assume potentials near to those of the collector so that the elementary capacitances are charged to $Q = C_M u_c$, where C_M is the capacitance of an element of the target and u_c is the potential difference between the signal electrode (plate) and the collector. The writing beam of energy of 10 keV scans the target (but not necessarily with the same raster as the reading beam). This results in a partial or complete discharging of the elementary condensers, depending on the intensity of the writing beam. The potential distribution so obtained is then scanned by the reading beam of constant intensity and this
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results in the appearance of a video signal across the resistance of the signal plate; the recorded potential pattern is thus gradually erased. The most important characteristics of the graphecon were measured by the dynamic method (by using pulses). The current of the signal plate, as a function of the potential difference between the signal plate and the collector for two values of the beam current is illustrated in Fig. 3. It is seen that when the target is bombarded by an electron beam a current is produced in the signal-plate circuit; this current changes its polarity when the voltage between the collector and the signal plate is varied. The dependence of the signal-plate current on the acceleration potential of the electron beam and the potential of the correcting ring was also measured. An equivalent circuit for the signal plate is suggested; this consists of 5 resistances, 3 stray capacitances and C_M. Spurious signals and noise in the signal-plate circuit can be reduced by using the peculiarities of the current-voltage characteristic of the target; it is noted that the current is zero at a certain fixed potential of the signal plate. The noise reduction can also be achieved by
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using the correcting ring as the signal electrode.
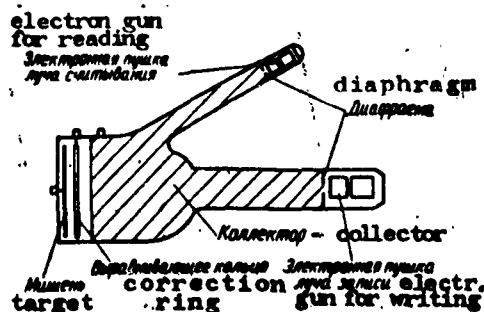There are 11 figures.

Fig. 1:

electron gun for reading
Электронная пушка луча считывания
diaphragm
Диафрагма
Коллектор – collector
Мишень target
correction ring
Отклоняющее кольцо
Электронная пушка луча записи
electr. gun for writing

Fig. 3:

$I_{cn}(\mu\kappa a)$

$U_a = 10 \kappa V$

50 40 30 20 10   -10 -20 -30 -40 -50 $U_{kn}(V)$

$I_o = 5 \mu\kappa a$

$I_o = 10 \mu\kappa a$

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